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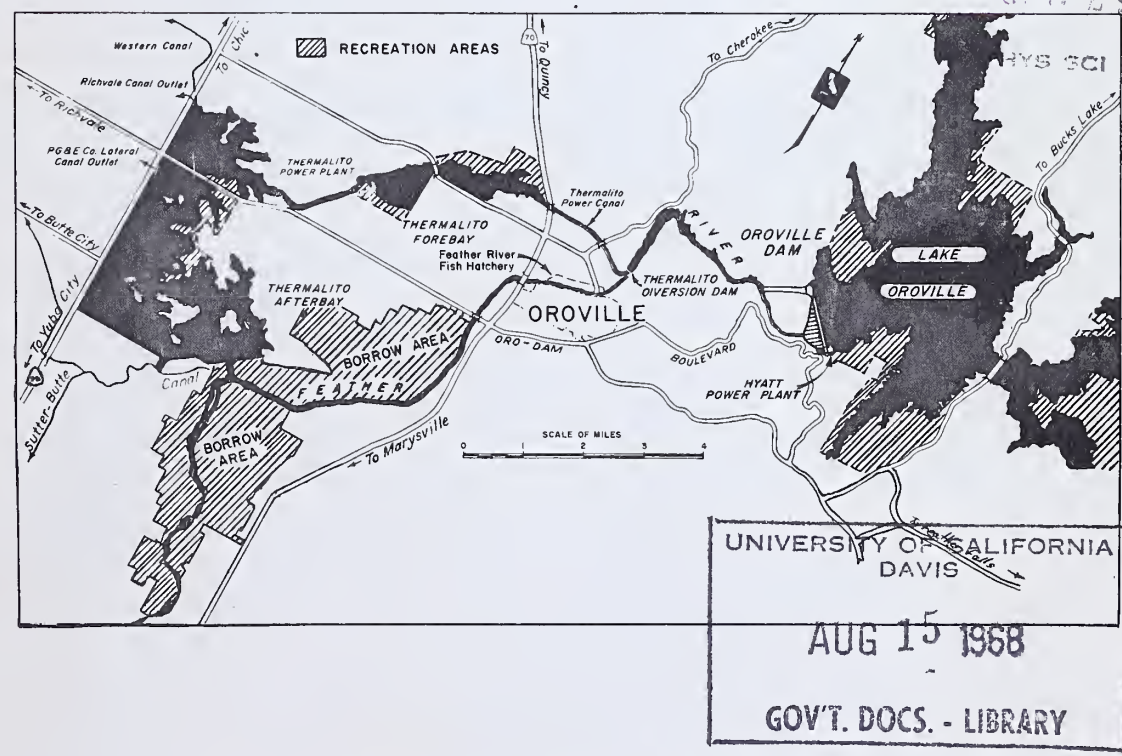
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OROVILLE BORROW AREA

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Water Resources Recreation Report

JUNE 1968

RONALD REAGAN
Governor
State of California

WILLIAM R. GIANELLI
Director
Department of Water Resources



Great Blue Heron - One of the 128 species of birdlife found in the borrow area.

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FOREWORD


This bulletin presents a plan for development of the recreation and fish and wildlife potential of the Oroville borrow area. It contains information necessary to support a budget request for General Fund appropriations for initial development and operating costs during the first year of operation. The bulletin represents the combined efforts of the Departments of Water Resources and Fish and Game under Interagency Agreement No. 253405. The Department of Parks and Recreation participated in the early stages of planning.

As stated in the Davis-Dolwig Act (Sections 11900-11925 of the California Water Code) and in Sections 345 and 346 of the California Water Code, the Department of Water Resources is responsible for the planning of facilities for recreation and for preservation and enhancement of fish and wildlife at state water projects in consultation and in cooperation with the Departments of Parks and Recreation and Fish and Game and all appropriate federal and local agencies, and for acquiring land necessary for the planned facilities, with the approval of the Department of General Services.

Under the Davis-Dolwig Act, the Department of Fish and Game is responsible for managing fish and wildlife resources at units of the State Water Project in a manner compatible with other uses.

In February 1967 the Administrator of the Resources Agency established a task force to conduct a review of the state program for the planning and development of recreation facilities and fish and wildlife enhancement in connection with the State Water Project. The primary mission of this Task Force was to recommend a program of recreational facilities which will adequately serve the public without excessive public costs. The task force reviewed plans for 49 proposed recreation projects, including the borrow area. In August 1967 the Task Force's report was transmitted to the Administrator. Its recommendations for the borrow area are quoted on page 5.

The Department of Water Resources recommends that the borrow area be developed as described in this report. It concurs with the recommendation of the Recreation Task Force on development of the borrow area that "sufficient funds be provided at an early date to the Department of Fish and Game under the Davis-Dolwig Act"


William R. Gianelli, Director
Department of Water Resources
The Resources Agency
State of California

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CONCLUSIONS

As a result of studies by the Departments of Water Resources, Fish and Game, and Parks and Recreation, it is concluded that:

1. The Oroville borrow area and the adjacent Feather River have high potential for fish, wildlife, and recreation and will receive substantial use.

2. The initial development described in the report will enhance fish and wildlife and accommodate the anticipated public use in the first years of operation. Thereafter, additional development will be required to satisfy continued increases in use.

3. The pervious borrow area is subject to frequent and extensive inundation by the Feather River. Operation of Oroville Dam for flood control will not eliminate this condition. This precludes intensive development of recreation facilities and presents problems in management of the warmwater fishery.

RECOMMENDATION

The borrow area should be developed as described in this report.

ABSTRACT

The State of California has acquired extensive holdings of dredger tailings and rangelands southwest of Oroville in Butte County and bordering the Feather River for 9.5 miles. About 80,000,000 cubic yards of rock, sand, and clay were removed for construction of Oroville Dam, a feature of the State Water Project. These lands, amounting to about 5,500 acres, will be retained in state ownership for fish and wildlife enhancement and recreation purposes, under the administration of the Department of Fish and Game. / This area is readily accessible from existing roads and highways. Removal of materials and construction of roads have substantially improved interior access. The area contains numerous ponds which support warmwater fish of various species, and also provide habitat for numerous birds and mammals. / Fishing, hunting, wildlife observation, and river-associated recreation will be the principal activities of visitors. The area is uniquely suited to these activities, but being subject to frequent inundation, a low-density development of basic public use facilities is appropriate. Management plans are directed toward improving fish and wildlife habitat and providing public opportunity for enjoyment of the area's fish, wildlife, and scenic resources. / In accordance with the Davis-Dolwig Act, General Funds will be requested in 1969-70 for development of initial facilities. / The estimated capital cost of initial development is \$186,500. This would provide for the purchase of vehicular equipment and miscellaneous supplies, construction of an office and equipment shed, and installation of picnic tables, signs, and gates. Heavy vehicular equipment would be used continuously for habitat improvement and development for public use. The estimated operation and maintenance cost for the first year is \$80,700. / The estimated use is 56,000 visitor-days in 1970, increasing to 314,000 visitor-days in 2017. Additional use would occur in the 350-acre impervious borrow pit if proposed shooting and archery ranges are developed and operated by local organizations under agreement with the Department of Fish and Game.

CHAPTER I. INTRODUCTION

The California Legislature has declared through enactment of the Davis-Dolwig Act that recreation and the enhancement of Fish and wildlife resources are among the purposes of state water projects.

Prior to beginning construction of Oroville Dam, a key storage facility of the State Water Project, the Departments of Fish and Game and Water Resources became interested in the use of the borrow areas for fish, wildlife, and recreation after construction ended. These borrow areas were to be the source of fill material for construction of this huge embankment dam.

A March 1962 report^{1/} of the Department of Fish and Game presented a biological evaluation of the then existing borrow areas and made recommendations to realize their potential for fish and wildlife enhancement after project completion.

These recommendations included retention of the lands in state ownership and preservation of designated "restricted" areas in their preproject conditions.

Some 5,700 acres of borrow area lands were subsequently acquired by the Department of Water Resources. When borrow operations were completed in October 1967, more than 80,000,000 cubic yards of rock and earth, covering about 4,700 acres, had been removed. About 200 acres of land have since been returned to Butte County for relocation of sanitary dumps and materials areas which stood in the way of borrow operations.

^{1/} "A Preliminary Evaluation of the Oroville Borrow Areas for Fish and Wildlife Enhancement and Public Recreation".

Excerpt from "Report of the Recreation Task Force on the State Water Project", August 1967

"Recommendation: The Task Force recommends that the Oroville borrow area be set aside and managed solely as a fish and wildlife area under the direction of the Department of Fish and Game. We further recommend that it be permitted to develop into a natural area and that no facilities be constructed other than those necessary for health and safety and project operation.

"The Task Force further recommends that sufficient funds be provided at an early date to the Department of Fish and Game under the Davis-Dolwig Act to provide for work necessary to help nature bridge the gap between a converted borrow pit and a wildlife area. Included in such items should be deepening of existing ponds where appropriate to provide good warmwater fish habitat, either fencing or marking of boundaries, and removal of construction scars where necessary.

"In addition to the potential wildlife areas there were some borrow areas where such a potential did not exist. The 350 acre impervious material borrow area, a deep hole with clay banks and little wildlife or fisheries potential could possibly be leased for rifle, shotgun, pistol, and archery ranges. These developments should be accomplished with private or organizational capital funding."

The location of the borrow area in relation to the State Water Project facilities and recreation areas near Oroville is shown on the cover. The borrow area is located southwest of the City of Oroville and borders the Feather River for 9.5 miles. Recreational developments providing for picnicking, camping, and boating are planned for Lake Oroville

and Thermalito Forebay and Afterbay. These plans are presented in Bulletin No. 117-6, "Oroville Reservoir, Thermalito Forebay, Thermalito Afterbay - Water Resources Recreation Report", December 1966. This Bulletin No. 117-18 presents plans for the effective use of the borrow area lands for fish, wildlife, and recreation.



Oroville Dam, 770 feet high, contains about 80,000,000 cubic yards of clay, cobbles, sand, and gravel. All of these materials came from the Oroville borrow area.

CHAPTER II. DESCRIPTION OF THE BORROW AREA

This chapter presents a description of the borrow area and the adjacent Feather River. The boundary of lands available for fish, wildlife, and recreation is also defined. Plate 1 (pages 16 and 17) shows the locations of the borrow area features to be described.

Two different kinds of fill material were placed in Oroville Dam. Material for the impervious clay core was removed from a 350-acre area directly south of the Oroville airport. The pervious materials, consisting of cobbles, sand and gravel, were removed from a major portion of the remainder of the borrow area.

Impervious Material Area

Before borrow operations, this area was uncultivated rangeland. Borrow excavation has left a flat-bottomed pit which is about 35 feet below the surrounding lands on the north, west, and south sides. The slope of the excavation at the periphery is no steeper than $1\frac{1}{2}$ to 1. This pit is well drained and contains no permanent ponds.

Pervious Material Area

This area is located on the Feather River flood plain. Prior to the beginning of borrow operations, it consisted primarily



General view of borrow area during construction. Area A (right foreground) had been extensively mined at this time. Wooded area in right center was restricted from borrow operations for wildlife protection purposes.

of desolate ridges and piles of rock left by gold dredging, which began in 1898 and continued until 1952. Many of the depressions in these dredger tailings were permanently ponded. These ponds varied considerably in size and shape and were supplied with standing water by river seepage and flooding. A wide variety of vegetation existed at the ponds, between the ridges, and along the Feather River and other watercourses.

The extensive dredger tailing lands covered an irregular area, which was divided into subareas by the Feather River and the Western Canal. During construction these and other subareas were identified alphabetically (Plate 1).

Not all of the dredger tailings within the acquired area were needed for the dam. Efficient borrow methods and generally high-quality material made it unnecessary to enter all acquired areas. Remaining tailings are located primarily in areas E and H at the southern extremities of the tailings area.

Borrow operations have leveled areas A, B, C, D, and G to an elevation roughly 3 feet above the summer flow level of the Feather River. At various locations these leveled areas are pocked with water-filled sloughs and extra deep excavations.

Three systems of embankment exist within and adjacent to the excavated areas. Along the river's edge, training dikes were constructed to protect the excavated areas from destructive action of flows up to 150,000 cfs and prevent erosion of material from excavated areas into the river. They channelize the river, but allow seepage into the leveled areas at higher river stages.

Four control weirs, built of sheet steel piling, have been constructed in the dikes. These weirs allow free flow into the excavated areas when the river flow reaches 50,000 cfs.

The second system of embankments was built for the haul railroad used to transport material to the dam. This embankment passes through areas A, B, and C in the northern half of the pervious area and has several turnaround loops, one leading to the impervious area.

The third system of embankments consists of flood control levees, which are located adjacent to the west boundary of the pervious borrow area. These levees were built in prior years independent of project consideration.

The Feather River and Western Canal

The Feather River through the borrow area is a series of long pools and short, fast riffles over a predominantly cobble and sand bottom. The banks are well shaded by a moderate to dense stand of willows, cottonwoods, and other riparian vegetation.

The river is relatively clear after the spring snowmelt runoff and stays clear through summer and early fall. It should become even clearer with the settling of silt in Lake Oroville and the pools behind Thermalito Diversion Dam and the Feather River Fish Barrier Dam.

Operation of Lake Oroville will decrease, but not eliminate, flood flows past the borrow area. Estimated project average exceedence intervals for various peak flood flows are shown below. For example, a flow of 100,000 cfs (cubic feet per second) can be expected to be exceeded once in 8 years on the average, or about 6 times during a period of 50 years.

2.0 years for	20,000 cfs
2.7 years for	50,000 cfs
8 years for	100,000 cfs
40 years for	140,000 cfs

With the exception of flood control releases from Oroville Dam, flows down the Feather River between the Thermalito

Diversion Dam and the Thermalito Afterbay river outlet will be maintained at 400 cfs. Below the river outlet, flows will generally be as follows:

October-March - 1,700 cfs
April-September - 1,000 cfs to about 6,000 cfs, depending on downstream demands

Compared with preproject flows, project operation will generally result in decreased summertime flows above the river outlet and increased summertime flows below. Previously, river flows had been significantly reduced during the summer by irrigation diversions via the Sutter-Butte Canal and the Western Canal. These diversions are now made from the Thermalito Afterbay.

The Western Canal has been blocked by Thermalito Afterbay Dam approximately 3 miles from its origin at the Western Canal Diversion Dam. This reach of the canal has been abandoned by its former owner, but will be retained essentially in its preproject condition by the State.

A 2-mile canal section east of the headgate is open to the river. Therefore, water depth fluctuates directly with the river stage. The canal, ranging in width from 50 to 150 feet, is bordered by a moderate to dense stand of vegetation and by training dikes. West of the headgate, the canal narrows and the banks become bare of trees. A flood control levee runs along the southern edge.

At the present time, it is not known if the Western Canal Diversion Dam will be kept in service. Continued operation is desired by certain local interests for the purpose of maintaining the esthetic quality of the Feather River near Oroville.

This dam is a timber crib structure fitted with flashboards. Raising of the flashboards increases water depth in the

Western Canal and the river a maximum of about 4 feet.

Hydrology

Water levels in the pervious borrow area fluctuate with water levels in the Feather River and the abandoned portion of the Western Canal. Aerial surveillance has revealed that a river flow of about 10,000 cfs causes seepage through the training dikes and ponding in parts of the leveled areas. At river flows above 20,000 cfs there is standing water over practically all of the mined areas (photo on page 10).

The extent and expected frequency of inundation therefore precludes the construction of facilities in the excavated areas which are susceptible to water damage.

Ground observations consisted of water level measurements and soundings in ponds and canals scattered throughout the pervious area. This provides knowledge of the suitability of these water areas for fish habitat at the lower ranges of water levels. The results of these observations are described in Chapter III.

Access

Most of the borrow area is accessible by a combination of vehicular travel and a short walk. There are miles of construction roads on the crest of the embankments, on embankment berms, and into the mined areas. These roads cross the Western Canal at two locations.

The periphery of the borrow area is readily accessible from the present network of paved roads. State Highway 99E and Larkin Road pass to the west, intersecting many east-west roads leading to the borrow area. These include Almond Avenue, Palm Avenue, Cherry Avenue, Biggs Avenue, Hamilton Road, and Merced Avenue (State Highway 162) skirting the northern boundary.



Inundation of areas A, B, C, and D. Feather River flow is about 38,000 cfs.

Hamilton Road and Larkin Road both connect to the relocated Oroville-Willows county road which runs along a berm on the Thermalito Afterbay Dam and passes close to the northwestern boundary of the borrow area. Access from the Oroville-Willows Road will be available

along a new county road leading eastward to a relocated waste disposal site.

State Highway 70 and Pacific Heights Road pass to the east and provide access to areas east of the Feather River.

Boundary of Recreation Lands

The boundary of borrow area lands to be used for recreation and fish and wildlife enhancement (Plate 1) is tentative pending state acquisition of certain parcels totaling about 200 acres located in areas G and H. The area within this tentative boundary is about 5,500 acres of land and water, exclusive of the Feather River channel.

This area includes a pond which is separated from the south limits of the main boundary along Almond Avenue. According to the agreement on exchange of borrow area lands between the Department of Water Resources and Butte County, this pond will be retained by the State. The agreement provides easements for public access to this pond.

Adjacent Land Use

Present and expected future uses of adjacent lands are compatible with use of the borrow area for fish, wildlife, and recreation. Peripheral lands consist mainly of more dredger tailings, rangeland, and orchards. Nearby residential and commercial developments are low-density, with the greatest concentration along Merced Avenue and State Highway 70. The Thermalito Afterbay, the Oroville-Willows county road, and the low-traffic Oroville airport border area C and the impervious area.

Butte County's relocated waste disposal site will be located between the Western Canal and the impervious pit. This disposal site will be fenced and operated

by cut-and-cover methods. It is anticipated the County will plant the necessary shrubbery to preserve the scenic values of the borrow area.

With the exception of a slow rate of increase in residential and commercial developments along Merced Avenue, the Oroville-Willows road, and State Highway 70, little change is foreseen from present use of adjacent lands.

The borrow area, by its sheer size and peripheral embankments and vegetation, provides visitors with a feeling of isolation from residential and commercial developments on adjacent lands.

Climate

The climate of the borrow area is typically Mediterranean, as is that of the Sacramento Valley. This permits year-round recreation use of the area.

Normally, the rainy season begins in October and continues through April. The average annual precipitation is about 25 inches. Thunderstorms, snowstorms, or hailstorms rarely occur. Rains may continue for several days at a time, but are usually gentle. Fogs of varying density and duration occur during the winter.

During the spring and occasionally at other seasons of the year, winds of high velocity sweep over the area. The windstorms are generally of short duration. The summers are characterized by low relative humidity, high temperatures, and cloudless skies.



"Audubon Island", Western Canal, and area A. "Audubon Island" has a high wildlife value. (River flow is about 38,000 cfs.)

CHAPTER III. FISH AND WILDLIFE

Before borrow operations the Oroville tailings area supported a great variety and abundance of fish and wildlife. The river and most of the ponds provided habitat for self-sustaining fish populations. The vegetative cover at the ponds and along the Feather River and other watercourses provided habitat for resident and migratory wildlife. Over 128 species of birdlife and 13 species of mammals were reported seen in the area.

Concurrent with the borrow operations was the disruption of habitat and displacement of resident fish and wildlife. Following borrow operations, natural revegetation of the mined areas has occurred. This has been accompanied by a return of wildlife in increasing numbers. Many of the newly excavated water areas have been populated by resident warmwater fish.

Several problems relating to fish and wildlife are evident in the present condition of the area.

Wildlife Refuge and Protection

Refuge areas for wildlife displaced by borrow operations were distributed throughout the tailings. These included three restricted areas having high wildlife value, the undisturbed riparian habitat along the Feather River, and other unmined areas.

Of the latter, "Audubon Island", with its dense growth of mature vegetation, was especially valuable in providing escape cover. This island (page 12), located between the Feather River and the Western Canal, was formed by construction of a new overflow channel and spillway for the Western Canal. There is no flow in the channel at low river stages.

Measures to protect wildlife during construction consisted of controlled public access into the area, prohibition of hunting and poaching, and surveillance by a Department of Fish and Game patrolman.

Regrowth of Vegetation

Revegetation of the excavated areas has been rapid. Periodic inundation during construction has hastened the introduction and growth of phreatophytes, principally willow and cottonwood. Such growth constitutes the dominant plant cover in the leveled areas. Other early regrowth consists primarily of annual grasses and forbs. The edges of many excavated ponds have filled in with dense riparian growth, notably cattail, mugwort, and western ragweed.

Wildlife Repopulation

Removal of the barren rock piles has greatly improved conditions for California quail and mourning dove. There has been a notable increase in these birds, due to the creation of open space with interspersed edge cover and better food conditions occurring with revegetation.

The newly created ponds and watercourses have attracted water birds, waterfowl, and aquatic fur-bearers. Large concentrations of migratory waterfowl occur in the area when flood flows result in inundation. Numerous broods of mallard and cinnamon teal are continually being observed, as well as common gallinule and American coot. Great blue heron and Anthony's green heron are now frequently seen in the borrow area due to the abundance of fishlife and aquatic animal life. Also, reports indicate that beaver, muskrat, and black-tailed deer are reestablishing themselves in the area.

Fish Habitat

More than a hundred ponds with suitable depths for fish remain from borrow excavations. They range in size from a few hundred square feet to one about 85 acres. Most are long and narrow, U-shaped in cross-section, and of uniform depths. Side slopes vary from steep to gentle.

There are three general types: preproject ponds, newly excavated wooded ponds, and newly excavated exposed ponds. A fourth type of waterway is the drainage canal system which was excavated by the dam contractor in area D. The total area of ponds and canals is about 325 acres.

Virtually all the preproject ponds were formed by the gold dredging. Those in areas G and H are moderately deep and are bounded by steep ridges of dredger tailings, which prevent overflow during flooding (photo below). Their bottoms are composed of cobbles, overlain with varying amounts of silt. At three undisturbed ponds in area C, shorelines are not as steep, water depths are not as great, and the rich silt bottom is quite thick. These ponds support varying amounts of submergent or emergent vegetation. Mature stands of cottonwoods line their shores.

The newly excavated wooded ponds are located in areas A, B, and C. Shorelines are of gentle gradient and depths



Preproject ponds in area H. Note steep banks. Only a small portion of area H was mined. Area E in background.

are a rather uniform 10 to 15 feet. Bottoms are usually sand overlain with a light coating of silt. Bordering vegetation consists of stands of medium- to large-sized cottonwoods and willows. Leaves and insects falling from these trees enrich these ponds and make them more productive of aquatic life than the exposed ponds with barren shorelines.

The drainage canal system (photo below) extends around area D for about 6 miles. Width of the canal averages about 50 feet and approaches 200 feet in some places. Bank vegetation is largely restricted to saplings, weeds, and grasses.

As previously stated, water levels in these ponds and canals fluctuate with

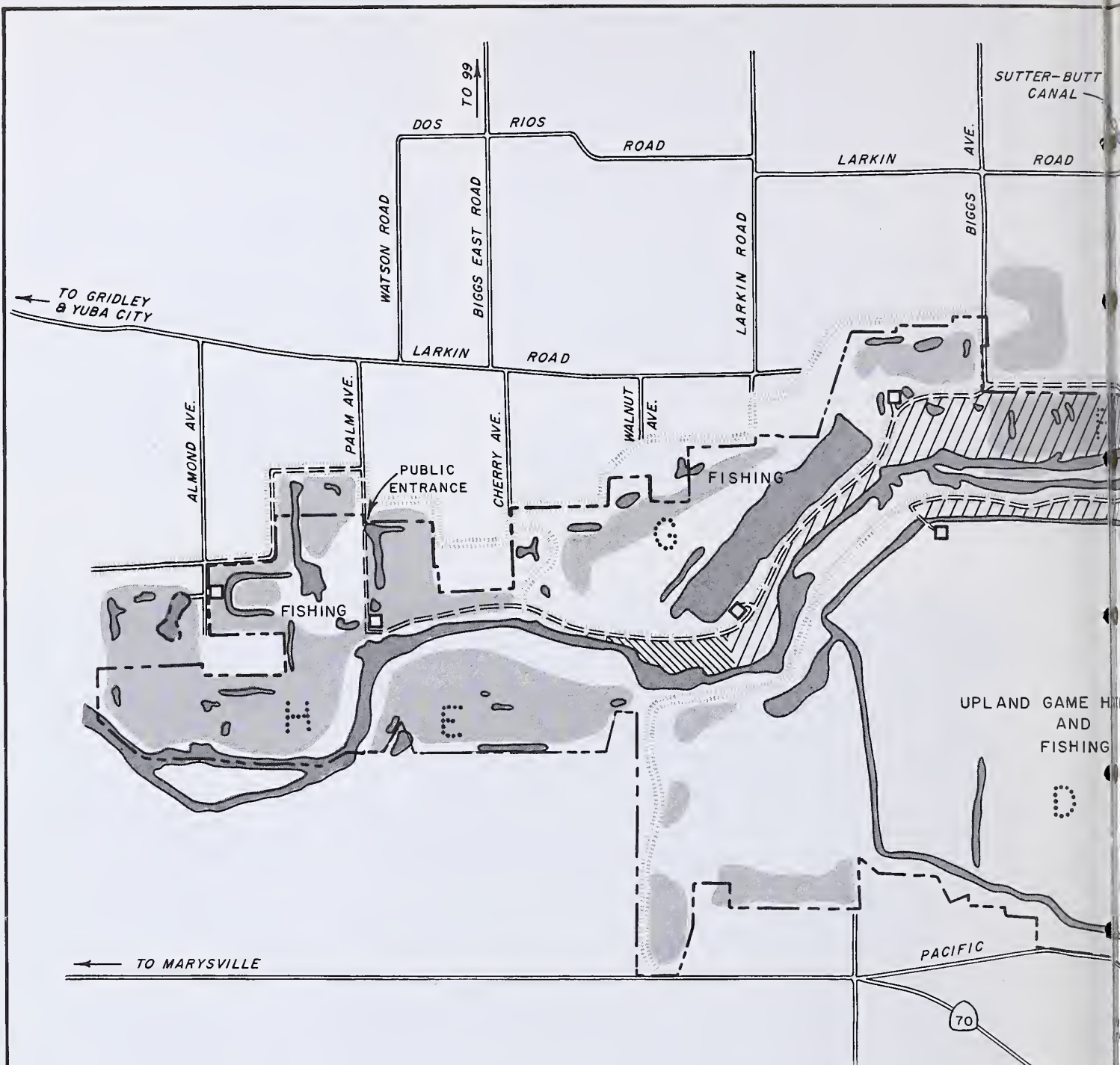
those in the adjacent Feather River and Western Canal stub. The fluctuation in any pond depends on its distance from the river and the nature of its substrata. Generally, ponds close to the river have porous substrata and therefore fluctuate the most.

With low river flows (400 cfs to approximately 1,000 cfs), water depths are about 5 feet in the drainage canal and 7 feet or more in the ponds. The increase in depth with river flows up to 10,000 cfs generally ranges from 1 to 5 feet.

Increases in depth up to 4 feet in certain ponds occur under project flow conditions with raising of the flashboards and sealing of leaks in the Western Canal



Feather River, area D (right center) and area C (background). Note portion of drainage canal system in area D. Sutter Butte Dam (left foreground) and construction bridge were later removed.



NOTE:

OROVILLE-WILLOWS ROAD NOW
LARKIN ROAD
MERCED AVENUE NOW ORO-DAM
WEST BLVD

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
DEPARTMENT OF WATER RESOURCES

**OROVILLE BORROW AREA
LAND USE AND
GENERAL DEVELOPMENT PLAN**

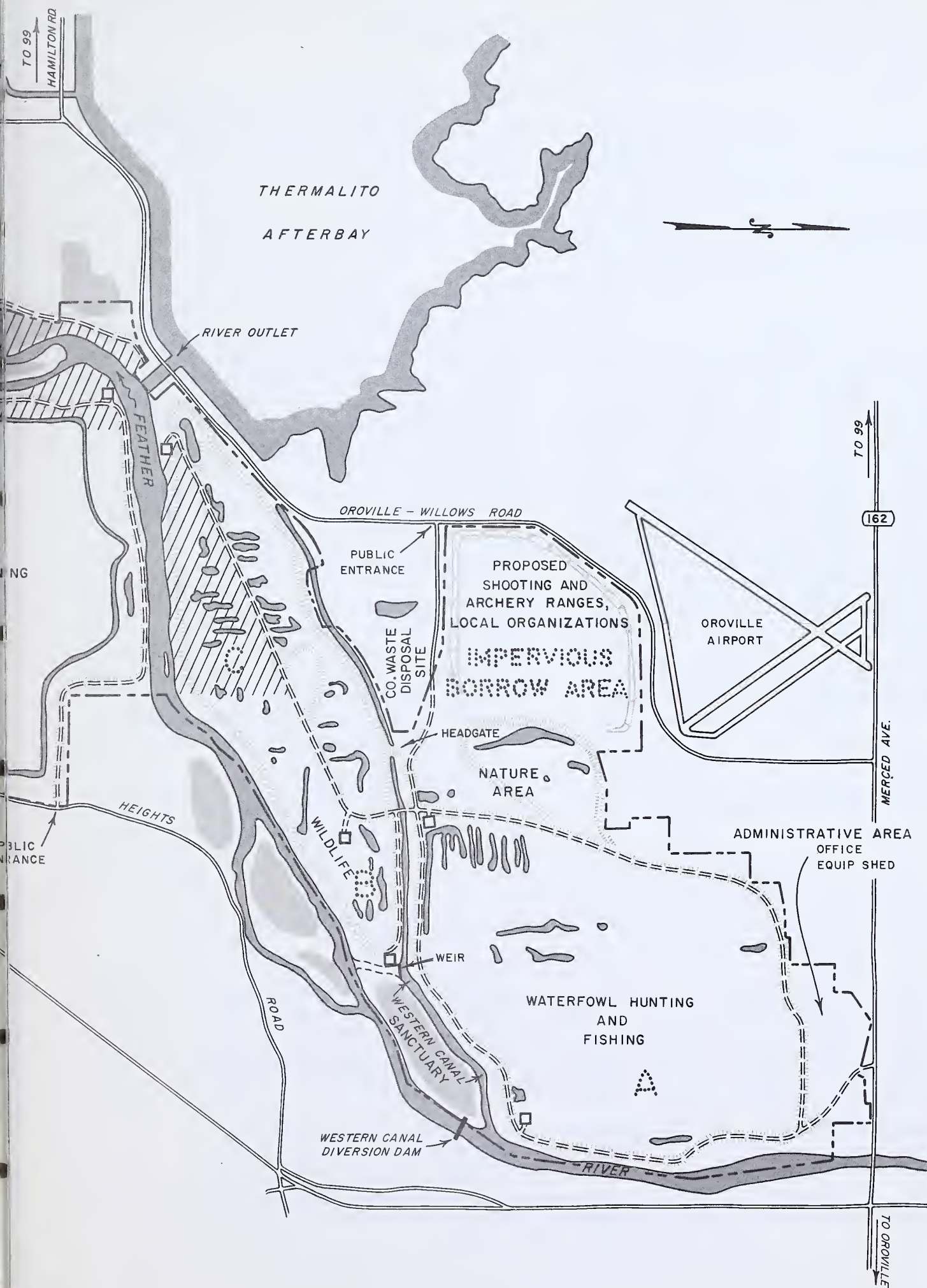
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SCALE OF FEET

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LEGEND

- BOUNDARY OF WILDLIFE AND RECREATION AREA (TENTATIVE)
- SUB-AREA DESIGNATION
- == PAVED ROAD
- == UNPAVED ROAD TO BE USED FOR PUBLIC ACCESS
- PARKING AREA
- ▨ PICNIC AREA
- ▨ CAMPING AREA
- PERMANENT WATER AREAS, GENERALIZED
- EMBANKMENT
- CUT SLOPE
- DREDGER TAILINGS AS OF DEC. 1967



Diversion Dam. However, continued operation of the dam would not significantly affect the number and acreage of the existing water areas, since those ponds most influenced have sufficient depths and steep banks.

The major benefit to the borrow area of continued operation lies in the planned excavation of additional ponds. With a higher water table resulting from raising of the flashboards, the required depth and volume of excavation would be decreased for some of these ponds.

Fishlife

Thirty-nine species of fish either now exist or can be expected to exist in the ponds and canals and the nearby river. The undisturbed ponds continue to support warmwater fish populations. Many of the newly excavated ponds and canals contain warmwater fish, which have traveled from the river or adjacent ponds during overflow periods. One species usually predominates in any pond, with the largemouth bass found most frequently. The list below shows the expected habitat of the most common game fish.

The Feather River is the most important king salmon spawning tributary in the Sacramento River system. Presently, it supports an average annual run of 60,000 king salmon, of which 55,000 are fall-run and 5,000 are spring-run. Fall-run fish ascend the river from October 1 to

November 15 and spawn from the mouth of Honcut Creek (9 miles below the borrow area) upstream to the Fish Barrier Dam at Oroville.

Removal of the Sutter-Butte Dam in connection with water project construction has extended the upstream run of American shad and striped bass. This dam was located 0.3 mile below the river outlet site.

Management Problems

Many of the borrow area ponds, particularly those recently excavated, are subject to frequent overflow and merging with nearby ponds. Fish can then intermingle among ponds or enter via the flooding river. Rough fish, notably carp and other members of the minnow family, exist in the river and some of the ponds. Periodic infestation of these ponds by rough fish reduces their fishery potential. The intermingling of incompatible game fish also tends to reduce fishery potential.

Uncontrolled growth of willows and cottonwoods in the excavated areas could result in extensive areas of dense sapling forests in the near future. Selective cutting and control measures will be required to maintain the carrying capacity of these lands for wildlife.

Uncontrolled growth of aquatic weeds in the newly excavated ponds would reduce fish habitat and impede angler access.

<u>Habitat</u>	<u>Fish Species</u>
Rocky bottom ponds and canals	Largemouth bass, smallmouth bass, green sunfish, black crappie
Sandy or silty bottom ponds	Largemouth bass, bluegill, white crappie, brown bullhead
Feather River	Smallmouth bass, green sunfish, white catfish, channel catfish, king salmon (fall and spring runs), steelhead (winter and spring runs), American shad (June run), striped bass (June run).

CHAPTER IV. RECREATION EVALUATION

Recreation use at two similar river areas was considered in predicting recreation use of the borrow area. These two areas are Lost Lake County Park on the San Joaquin River in Fresno County below Friant Dam and the 23-mile reach of the American River below Nimbus Dam in Sacramento County.

The Lost Lake area was initially developed by the Wildlife Conservation Board to provide public fishing access to the river and borrow pit pond. Public use increased rapidly and visitation closely approximated the use occurring upstream at Millerton Lake State Recreation Area during the height of the recreation season in 1964.

The American River flows through a dense urban area. Although public access is limited to certain areas, about 900,000 visitor-days of recreation use occurred along this river reach during 1967.

This information demonstrates that the combination of public access and increase of summertime flows by upstream dams attract increasing numbers of recreationists to a river. This will occur below the river outlet. The borrow area comprises the longest continuous reach of the lower Feather River now available to the public, and should attract much of the increased use.

Recreation Activities

A unique combination of recreation activities will be available in the borrow area. Fishing, hunting, wildlife observation, and general recreation, mostly river-associated, will appeal to a wide segment of the population seeking outdoor recreation.

Fishing

Fishing will occur at the ponds and canals in the borrow area and along the

Feather River downstream of the river outlet. The Feather River is presently closed to all fishing from the river outlet upstream to the Fish Barrier Dam.

It is estimated that the existing ponds and canals will initially provide 22,000 angler-days of use annually. This estimate is based on (1) the Department of Fish and Game's criteria of an average catch of one pound per angler-day for satisfactory warmwater angling, and (2) a yield of 50 to 100 pounds of warmwater game fish per acre of water surface.

The harvest potential and use can be increased by an intensive fish management program and by excavation of additional fishing ponds. With the equipment and manpower described in Chapter V, an additional 17 surface acres of fishing ponds can be excavated annually. This will initially support an estimated additional 850 angler-days of use each year. By 2017, pond acreage could be in excess of 1,100 acres. This would support over 60,000 angler-days of warmwater fishing annually.

Fishing along the Feather River will be for salmon and steelhead, American shad and striped bass, and resident warmwater fish.

Under present legal restrictions, salmon and steelhead fishing is expected to remain at 1,800 angler-days annually in the river reach adjacent to the borrow area.

Use of the American shad and striped bass fishery before removal of the Sutter-Butte Dam was estimated to be 4,400 angler-days annually. With removal of this dam and improved public access to the river, this fishery is expected to increase appreciably. Likewise, there will be increased angling for resident warmwater fish, notably white catfish, brown bullheads, and smallmouth bass.

Angling use of the Feather River adjacent to the borrow area is expected to increase to 51,000 angler-days annually by 2017.

Hunting

The borrow area will provide both waterfowl and upland game hunting. It is planned to eventually develop a "pothole" type of waterfowl hunting whereby hunters can make use of decoys and concealed blinds.

On the basis of existing and planned water surface acreage, hunter dispersal, and present waterfowl regulations, it is estimated that annual waterfowl hunting will increase from 800 hunter-days in 1970 to 8,800 hunter-days in 2017.

Upland game hunting in the borrow area will be mostly for mourning dove, ring-necked pheasant, and California quail. Mourning dove hunting is expected to be at least 300 hunter-days annually. Approximately 3,000 acres will be available for pheasant and quail hunting. It is planned to provide a maximum harvestable population of these upland birds. An estimated 2,500 hunter-days annually could be provided.

Wildlife Observation

Analysis of visitation to Gray Lodge Wildlife Management Area demonstrates the increasing trend in nonappropriative use of wildlife. In 1966, this 6,760-acre waterfowl management area received 43,748 visitor-days of use, of which 26 percent was hunting, 25 percent was fishing, and the remaining 51 percent was nonappropriative use, mostly wildlife observation and sightseeing.

The Oroville borrow area is expected to be very attractive for sightseeing. Such visitation is expected to total 10,300 visitor-days initially and increase rapidly in the ensuing years.

General Recreation

The borrow area is expected to receive moderate use for recreation activities such as picnicking, camping, swimming, and boating. Desirable sites for picnicking and camping are available along the river. Swimming will occur both in the river and in ponds. However, there are no plans to provide special facilities for swimmers at this time.

Present plans are to limit boating on the river, ponds, and canals to car-top boats. With high summertime flows below the river outlet, the Feather River is expected to become increasingly attractive to fast-water boating enthusiasts.

A proposal has been made to convert the impervious borrow pit into a rifle and pistol range of National Rifle Association standards. An archery range has also been suggested. This proposal could be accomplished through a lease arrangement with Butte County. Private clubs could sublease from the County to develop and operate this area.

This range would fill a statewide need for a rifle range of national standards for competitive events. It could also provide for regional shooting events, firearm safety programs, and training of law enforcement personnel.

Recreation Use

Use of the borrow area with development and management as described herein will be greater than that use which would have occurred without a management plan. This increased use, over an extended analysis period, is the basis for the evaluation of recreation benefits by the Department of Water Resources. The year 1970 was assumed for completion of initial development, and therefore used as the initial year for the analysis. Prior to that time, recreation use of the area is expected to be relatively light.

TABLE 1

ESTIMATED RECREATION USE AT OROVILLE BORROW AREA^{1/}
(In Visitor-Days)

: With State Management :						
Year	: Angling ^{2/}	: Hunting	: Wildlife : Observation	: General : Recreation	: Total : (rounded)	: Without : Management
1970	31,200	3,600	10,300	11,100	56,000	18,000
1977	45,500	6,500	20,700	26,800	100,000	23,000
1987	59,900	7,700	33,000	39,600	140,000	28,000
1997	76,800	9,000	50,200	54,300	190,000	34,000
2007	95,900	10,200	72,000	70,800	249,000	38,000
2017	118,000	11,600	100,100	84,800	314,000	42,000

^{1/} Excluding any use of rifle ranges in the impervious borrow area.

^{2/} Based on pond construction schedule of 17 acres of new ponds being provided each year from 1975 through 2004.

Table 1 summarizes the recreation use predictions for the various outdoor activities previously described. It also shows the estimated use which would occur without development and management for public use.

In predicting future use without management it was assumed that the borrow area lands would be returned to private ownership, that no attempt would be made to improve the fish and wildlife resources, and that public recreation would not be encouraged. Under these conditions, any recreation use would be trespassing and mostly of local origin. Observed recreation use during 1962 was used to project use under these conditions through the analysis period. This projection takes into account present per capita rates of fishing and hunting, population increases, limitations of fish and wildlife resources, and access difficulties.

Recreation Benefits

Recreation benefits are computed by multiplying the anticipated recreation use by a unit value per visitor-day, and discounting the product over the analysis period.

The Department of Water Resources' method of determining the unit value per visitor-day takes two factors into consideration: (1) variety and quality of recreation, and (2) esthetic qualities of the site.

The Department of Parks and Recreation applied these factors to the borrow area and derived a unit value of \$1.10 per visitor-day. A unit value of \$0.50 was applied for use without management. At an interest rate of 4.0 percent, the increased present worth of recreation benefits for the 48-year period 1970-2017 is \$3,163,000 and the increased average annual equivalent value is \$149,000.



North American male raccoon. One of 13 species of mammals found in the borrow area.

CHAPTER V. THE OROVILLE WILDLIFE AND RECREATION AREA

This chapter describes plans of the Department of Fish and Game for development and management of the area. Such development and management is contingent on legislative approval of General Fund appropriations which will be requested in 1969-70. The Department of Fish and Game shall thereafter budget as a General Fund item all costs associated with continued development and management of the Oroville borrow area for fish, wildlife, and recreation purposes.

The transfer of borrow area lands is proposed to be effective July 1, 1968, under terms of an agreement between Water Resources and Fish and Game.

General Concepts

The plan of development for the Oroville borrow area is designed for three primary purposes: (1) to maximize the fish and wildlife value of the area through a continuing program of habitat development; (2) to provide public opportunity for enjoyment of fish and wildlife-associated recreation; and (3) to provide whatever facilities are required for public use and protection of the area. Land use and general development plans are shown on Plate 1.

To maximize fish and wildlife values, a comprehensive inventory of these resources is necessary. The inventory will identify those ponds requiring fish stocking, or elimination of rough fish and restocking. Studies of Feather River fish flows will provide information for protecting valuable salmon and steelhead spawning runs and establishing a productive river fishery. A long-range fish management plan will be developed.

This inventory will include a survey of existing wildlife populations and habitat needs. From this, a plan will be developed to maximize the hunting potential of the area.

Nonappropriative use of wildlife will be encouraged by providing access into certain wildlife areas closed to hunting via a system of nature trails with interpretative aids.

Public facilities as proposed in this report will accommodate low-density use. These facilities will be located to harmonize with public enjoyment of fish and wildlife and river-associated recreation.

The area will be posted to direct the public to designated areas for various activities. Vehicular access will be controlled by necessary road closures and location of parking areas.

Initial Development

It is expected that initial development will take place during fiscal year 1969-70 and be ready for public use in 1970. The planned initial development includes basic public use facilities such as picnic tables and chemical toilets; landscaping and control of vegetation; an office and equipment shed; and the purchase of vehicular and heavy equipment and miscellaneous equipment and supplies.

Continuing use of a dragline and other heavy equipment is planned to accomplish the initial development, to maintain these developments, and to provide a continuing program of vegetation control and habitat improvement.

Public Use Facilities

Control of public access will require posting of signs along the boundary and installation of signs and gates at public entrances. The location of the 3 initial public entrances is shown on Plate 1.

Initial public use facilities will consist of 50 picnic tables, portable toilets, and 11 parking areas. The latter

will be small areas which have been leveled and cleared with the acquired equipment. Picnic tables will be distributed around the picnic and camping areas shown on Plate 1. Portable toilets and litter barrels will be provided at the picnicking and camping areas and at all parking areas.

Landscaping

There is an immediate need to reshape ponded areas that have extensive shallow edges, and to surround these ponds with low-level dikes. Elimination of shallow edges will improve access and assist in eliminating or minimizing mosquito problems. The dikes will serve to prevent mixing of fish species and rough fish contamination during periods of borrow area inundation.

Other immediate needs are the removal of construction scars and hazardous conditions. Access lanes will be constructed to the shorelines of those ponds having steep, loose cobblestone banks and dense stands of overhanging trees.

When these immediate needs have been met, additional ponds can be excavated for increased fishing and hunting opportunities.

Vegetation Control

Control of plant succession in the excavated areas is necessary to provide maximum wildlife benefits and an esthetically attractive and accessible area. The long-range objective is to provide diverse, interspersed types of habitat with minimum management.

Annual phreatophyte control would be required on about 3,000 acres in the initial years. This control would be largely accomplished through use of a crawler tractor and rotocycle.

Accompanying the mechanical control of undesirable vegetation will be a program of seeding to desirable wildlife food plants. Effort would be directed to growing watergrass and cereal grains

where conditions permit. Area D offers the best opportunity for upland game habitat planting because of heavy deposits of sand and silt.

Costs

Table 2 itemizes capital expenditures for initial development of the Oroville borrow area. The estimated total capital cost is \$186,500.

The estimated operation and maintenance cost for the first year is \$80,700, as itemized in Table 3. Of this amount, \$50,000 provides for the staffing of the area, and the remaining \$30,700 covers operating expenses. These expenses include provision for maintenance of roads and portable toilets.

Future Development and Management

Initial development will be directed toward providing the minimal facilities needed to administer the area for public use and fish and wildlife in the first year of operation. The experience gained will help in planning future development and management of the area.

As the area becomes better known, recreation use and the need for facilities will increase. Additional funding will be required to provide new developments to meet this demand. Some form of user fee probably will be exacted to partially pay these costs. Most of the increased use of the area is expected to be by recreationists who do not purchase hunting and fishing licenses.

In addition, future consideration might be given to development of private concessions to provide public services which are out of the normal scope of responsibility of the Department of Fish and Game. This could take the form of a store selling bait, food, and drink.

Consideration will also be given to entering into borrow agreements with private interests for the removal of sand and gravel in a manner which will enable additional ponds to be excavated

TABLE 2
INITIAL DEVELOPMENT COSTS

No.	Facilities and Equipment Items	Description	Cost
1	Office, headquarters	20' x 40'	\$ 10,000
1	Shop and equipment shed	40' x 100'	50,000
50	Picnic tables	Concrete	1,800
1	Tractor	D-7, 10' blade with winch	50,000
1	Tractor	10-speed transmission with rotocycle	5,500
1	Dragline	Self-propelled, track layer, 1 cu. yd. capacity bucket	40,000
1	Trailer	Tractor maintenance, flat bed	1,000
1	Trailer	150-gallon water tank for fish hauling and fire fighting	1,500
5	Light-duty maintenance vehicles	Station wagon, pickups, and a 1-ton truck	12,000
	Miscellaneous equipment & materials	Includes a 12-ft. boat with motor, three 2-way radios, fish nets, office furniture, signs, gates and litter barrels	5,800
	Subtotal		\$177,600
	Contingency (5% of total)		8,900
	GRAND TOTAL		<u>\$186,500</u>

TABLE 3
OPERATION AND MAINTENANCE COSTS FOR FIRST YEAR

Manpower (Region 2, Fish and Game)			Cost
1	Associate Wildlife Manager-Biologist	12 months	\$10,872
1	Assistant Fishery Biologist	12 months	8,952
1	Fish & Wildlife Assistant	12 months	6,060
1	Heavy Power Shovel Operator	9 months	6,100
1	Tractor Operator-Laborer	12 months	7,367
	Subtotal		\$39,351
	11% retirement, medical, etc.		4,329
	16 Man-months Seasonal Aid (12 man-months for full season and 4 man-months for waterfowl season)		6,320
	Subtotal		\$50,000
Materials, Services and Expenses			
	Travel expenses		1,800
	Road maintenance, grading and oiling 17 miles of roads		7,400
	Operation of vehicular and heavy equipment		14,540
	Utilities		1,200
	Portable chemical toilet maintenance (contract)		3,360
	Control of vectors, aquatic weeds, and fish		2,400
	Subtotal		\$30,700
	GRAND TOTAL		<u>\$80,700</u>

and the landscape improved according to a long-range plan of development at little or no cost to the State. Any plan for material removal would be subordinate to protection and enhancement of fish and wildlife. It is possible some revenue will accrue to the State in addition to having ponds excavated at no cost. Any agreements negotiated with private parties would not preclude use of the property by the State for borrow purposes.

Economic Justification

Development and management of the Oroville Wildlife and Recreation Area under the proposed plan is economically justified. Costs and benefits for the period 1970 to 2017, computed at an interest rate of 4 percent, are summarized below.

<u>Costs</u>	<u>Present Worth in 1970</u>	<u>Average Annual Equivalent</u>
Initial Development	\$ 186,000	
Future Development	165,000 ^{1/}	
Operation and Maintenance	<u>2,168,000^{2/}</u>	
TOTAL	\$2,519,000	\$119,000
<u>Benefits</u>	\$3,163,000	\$149,000

^{1/} Assumed expenditure of \$100,000 in 1980 and every tenth year thereafter for replacement of equipment and for additional public use facilities.

^{2/} Based on the following assumptions:

- (a) A minimum annual operating cost of \$70,000.
- (b) A variable annual operating cost of \$0.20 per visitor-day.

COMMENTS OF OTHER AGENCIES

Butte County and interested state agencies have expressed general agreement with these plans for development and management of the Oroville borrow area. The Division of Highways finds no conflict with existing or planned state highway routes. The Reclamation Board finds the plans to be compatible with

flood control requirements on the Feather River. The Department of Public Health concurs with the plans for sanitation facilities and warns about the necessity of physical or chemical measures to control mosquito growth in the area.

Butte County, emphasizing the attractiveness of the borrow area to recreationists, urges that development be accelerated.

State of California	C O P Y	The Resources Agency
Memorandum		
To : Honorable William R. Gianelli, Director Department of Water Resources 1416 Ninth Street Sacramento, California 95814		Date: May 15, 1968
From : Department of Fish and Game		
Subject: WP - State of California, Department of Water Resources - Oroville Division, Bulletin No. 117-18, <u>Oroville Borrow Area, Water Resources Recreation Report</u>		
<p>We are pleased with your presentation of a fish and wildlife development plan for the Oroville Borrow Area. We concur with your report with a few minor exceptions which I assume will be taken care of by some suggestions my staff has conveyed to Mr. Werner of your Sacramento District. We have appreciated the opportunity to work with your Department in developing this Bulletin.</p> <p>Dedication of the lands and water surfaces in the 5,700-acre borrow area to public uses for fish and wildlife-oriented recreation will eventually be recognized as one of the substantial accomplishments of the State Water Project. Your planning report and its request for funding provides a good start towards commencement of development in 1969-70.</p>		
/s/ Robert L. Jones For Director		

State of California	C O P Y	The Resources Agency of California
Memorandum		
To : Honorable William R. Gianelli, Director Department of Water Resources Resources Building, 11th Floor Sacramento, California		Date : May 13, 1968 Subject: Review and Comments, Draft of Bulletin No. 117-18
From : Department of Parks and Recreation		
<p>Thank you for the opportunity to review the draft of the Water Resources Recreation Report for the Oroville Borrow Area. The Department of Parks and Recreation agrees generally with the concept of developing and operating the Oroville Borrow Area for fisheries and wildlife and those recreational uses which are associated with these primary purposes.</p> <p>We agree that the Department of Fish and Game is the logical agency to develop, operate and manage the area for public use. Use estimates and facilities planned to accommodate public use seem reasonable.</p> <p>Our only major criticism concerns the apparent lack of information on future facilities development and the costs thereof. I believe that it would be helpful to present more concrete information on the number, type and cost of facilities which will be required to accommodate future use.</p>		
		/s/ Frank D. Nicol William Penn Mott, Jr. Director
SPM:WJH:wh		
cc: Mr. Carl A. Werner, Sacramento District., Dept. of Water Resources, 3251 S St., Sacramento Mr. May Mr. Hjersman Mr. Reiner		

C O P Y

State of California

Transportation Agency

Memorandum

To : Mr. William R. Gianelli, Director
Department of Water Resources
Attention Mr. Carl A. Werner

Date: May 3, 1968
File: 03-But-162
03-But-99

From : Department of Public Works--Division of Highways

Subject: Bulletin No. 117-18

This refers to Mr. Werner's memorandum of April 5, 1968, forwarding for review and comment a copy of the Draft on the Recreation Report for the Oroville Borrow Area.

The proposed recreation area will not conflict with existing or planned State highway routes in this area. However, the Division of Highways has initiated negotiations for a borrow source in this area to aid in construction of the Route 99 freeway along the west side of Thermalito Afterbay.

Thank you for the opportunity to review the proposal and forward our comments.

/s/ D. G. Pengilly
D. G. Pengilly
Planning Engineer

C O P Y

State of California

The Resources Agency

Memorandum

To : Mr. Carl A. Werner
District Engineer
Sacramento District
Department of Water Resources
3251 "S" Street
Sacramento, California 95817

Date: May 10, 1968
File No: 1120.00.001

From : The Reclamation Board

Subject: Review and Comments, Draft of Bulletin No. 117-18

We have reviewed the proposed plans for converting the Oroville Borrow Area into a recreation and wildlife area. The planned use of this area is compatible with the flood control requirements on the Feather River which include periodic inundation of some of these lands during time of flood releases from Oroville Dam.

This office requests that in the final report the location of the right bank levee be delineated on Plate 1. This levee is a flood control project levee and is maintained by the Department of Water Resources. This levee is within Maintenance Area No. 7. We have outlined the location of this levee on Plate 1 on the enclosed report which we are returning.

/s/ A. E. McCollam
A. E. McCOLLAM
Chief Engineer and
General Manager

GLP:dm
Encl.

State of California		C O P Y		Department of Public Health	
Memorandum					
To : Department of Water Resources P.O. Box 388 Sacramento, California		Date : May 17, 1968			
Attention: Mr. Carl A. Werner District Engineer Sacramento District		Subject: Draft of Bulletin No. 117-18 Oroville Borrow Area			
From : Bureau of Sanitary Engineering					
<p>Review of the draft of Bulletin No. 117-18, Oroville Borrow Area, Water Resources Recreation Report, indicates the proposed sanitation facilities will protect the public health.</p> <p>This Bureau and the Butte County Health Department concur with the proposed plans for the sanitation facilities to serve the recreation area.</p> <p style="text-align: right;">/s/ H. B. Foster, Jr. H. B. Foster, Jr., Chief Bureau of Sanitary Engineering</p> <p>HEF GBG:mjh</p> <p>cc: Butte County Health Department (2) BSE: Sacramento Redding</p>					

State of California		C O P Y		Department of Public Health	
Memorandum					
To : Mr. Carl A. Werner, Dist. Engineer Sacramento District Dept. of Water Resources P. O. Box 9137 Sacramento, California 95816		Date : May 10, 1968			
		File No.:			
		Subject: Review & Comments, Draft of Bulletin No. 117-18			
From : Bureau of Vector Control Sacramento Office					
<p>We appreciate the opportunity to comment upon the draft of Bulletin No. 117-18 which is addressed to plans for the use of Oroville Borrow Area.</p> <p>Mosquito species present in the area are <u>Culex tarsalis</u>, the vector of encephalitis, <u>Anopheles freeborni</u>, the vector of malaria, and severe pest mosquitoes <u>Aedes melanimon</u>, <u>A. nigromaculis</u>, <u>A. sierrensis</u>, <u>A. vexans</u>, <u>Culex pipiens</u>, and <u>Culiseta incidens</u>. In addition, there are fifteen other species of mosquitoes that appear more sporadically. Butte County is in an endemic area for encephalitis.</p> <p>Mosquitoes occur in shallow depths of standing water. Their prospects for survival are considerably enhanced if they are protected by emergent plants which break wave action and shield the mosquito larvae and pupae from natural predators. Much of the borrow area will be inundated to shallow depths of water. If these areas have emergent vegetation, mosquito production can be expected, and has, in fact, occurred.</p> <p>This production will increase if nutrients enter the borrow areas. Upland regions have septic tanks that could supply nutrients.</p> <p>The borrow area quickly reflects changes in the water level of the river. This fluctuation of water level, by alternately wetting and drying the periphery, creates good conditions for the production of pestiferous mosquitoes of the genus <u>Aedes</u>. The eggs of <u>Aedes</u> are deposited on dry or moist soil and remain viable until they are subsequently flooded.</p> <p>Preventative measures would include removal of emergent vegetation initially and a weed maintenance program, water depths in excess of four feet to preclude encroachment of tules and cattails and to promote wave action which drowns mosquito larvae and pupae, steep banks, and access roads.</p> <p>Good fisheries help to reduce mosquito populations, but in situations in which conditions are favorable for mosquito production and tend to exclude predators, the degree of efficiency of the predators is too low.</p> <p>If recreational values are of sufficient import to justify the existence of habitats that are favorable for mosquitoes and mosquitoes are produced, it is the responsibility of the landowners to abate the problem. If permanent physical measures capitalized over the expected period of effective benefit are not feasible, the landowner could discharge his obligation by repetitive chemical treatment of mosquito larvae.</p> <p style="text-align: right;">/s/ Marvin C. Kramer Marvin C. Kramer Senior Vector Control Specialist</p> <p>MCX:rl cc: R.F. Peters, Chief Bureau of Vector Control</p>					

COPY

BUTTE COUNTY

LAND OF NATURAL WEALTH AND BEAUTY

COURTHOUSE, OROVILLE, CALIFORNIA
BOARD OF SUPERVISORS

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District 2 District 4

June 3, 1968

Mr. William R. Gianelli, Director
Department of Water Resources
The Resources Agency
State of California
Sacramento, California

Dear Mr. Gianelli:

This letter is in response to your proposed draft of Bulletin No. 117-18 (Oroville borrow area).

In general, your proposed bulletin reflects very good thought as far as total concept and potential of the borrow area for recreational and fish and wild life. Your determination as to the types of usage in the various areas appears to be sound. We do, however, have some concern about certain aspects of your report on anticipated usages. They are as follows:

General. It is difficult to interpret differences in ideas and recreational habits between people who are residents of a rural area that receives the impact of a construction project such as the Oroville Dam, and the people from the metropolitan areas who are always on the search for recreation. As a result of the big Oroville project, the Oroville area is blessed with two equally important recreational potentials. The obvious one is the vast expanses of water in the Thermalito forebay, afterbay and behind the big dam itself. The other less obvious one is the attraction that the Feather River will now have because of the access afforded to it by the removal of the rock piles in the borrow operation. This attraction should not be underestimated.

The Feather River, prior to the commencement of the construction project, was heavily used by the local residents from the area north of the Western Canal Dam to the present location of the Thermalito diversion dam. Along this area there were many sand beaches and quiet pools for swimming, boating, etc. The dam project took away many of these recreational areas from the local people. However, in exchange for that loss, there is a tremendous potential in the lower reaches of the borrow area.

Picnicking. I believe that you will find that as the local people become aware of this ease of access, you will be overrun by daytime picnickers in the lower reaches of the borrow area.

Camping. At present there are no sanitary facilities and unless corrective action is taken soon, you will have definite problems.

The lower reaches of the borrow area are readily accessible to people traveling north on highway 99E. This area offers one of the few low-land camping grounds in the northern part of the State. As soon as you show a camping ground on a state map at this location, the area will be flooded by travelers.

Mr. William R. Gianelli
June 3, 1968

Page 2

Fishing. Here again, we believe that you are underestimating the potential and the pressures you will see develop in the borrow area for fishing purposes. Locally, you have opened up a vast area, not only for the usual fishing pursuits, but also for frog hunting. Frog hunting, although unimportant to many people, is a favorite pastime in this area. Reports are already rampant of people harvesting vast quantities of frogs from the borrow area. As this information becomes common, many hundreds of people who never thought of frogs will join the quest.

In a tour made Memorial Day weekend, there were several hundred people noted in area G. Many of these people were local. However, some were campers from distant places. The people in two of these camps were anxious to spread the news of their find in the Bay area. I am sure that you realize what the results can be.

Vegetation. As laid out in your report, the area is fast recovering itself with cottonwoods, willows and other rapid-growing trees. We would suggest that consideration be given to the introduction of some of the slower-growing species which have not reseeded themselves, such as oaks, walnuts, etc., and that some attention be directed toward the management of blackberries and elderberries. Elderberries, although they often go unrecognized by the city dweller, are quite an attraction for the local people who readily recognize them.

Roads and trails. As in any primitive area, every road is an invitation to explore. The borrow area has many roads which will become traps for automobiles. They should be properly signed or treated as soon as possible. Otherwise you will be plagued with complaints of stuck vehicles. Our local people know the dangers of sand and cobbles. However, the metropolitan residents will be unknowing victims.

Development costs. Your general plan is very good. However, it is suggested that more thought be given to expanding the initial development costs in order to stay ahead of the number of visitors that will most certainly flock to this area.

Upland game. The word is already out in this area concerning the wild life potentials in both areas A and D. Particularly, the people are talking about dove, quail and deer. The reports of the amounts of deer and dove already in the area have developed considerable interest.

In conclusion, we want to say again that the draft is well done and the total concept quite sound. Our basic concern is that you will underestimate the attraction that this river-oriented valley floor recreational area will have for day use, the sports fishermen, the weekend camper and as an overnight stop for the traveler passing through. We feel strongly that the development of this whole borrow area should be accelerated both by private capital and public investment.

Very truly yours,

Butte County Board of Supervisors

by
/s/ Don Maxon
Don Maxon, Chairman

cc: Mr. Warren Cole
Mr. Carl Warner

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